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DEPARTMENT OF NATURAL RESOURCES

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Minerals Inspection Report

Reviewed 

Report Date: **May 5, 2015**

Mine Name: Pearl Queen Mine - Pearl Queen area (SITLA)	Permit Number: M/001/0027	Mine Status: Reclaimed
Operator Name: Basin Perlite Company	Inspection Date: 7/1/2014	Permit Fees: Paid
Inspector(s): Peter Brinton	Inspection Time: evening	Bond Amount: \$57,700
Attendee(s): none	Weather: warm, sunny	Bond Escalation: N/A
Inspection Purpose: Operator requested bond release		Prior Inspection: 9/30/2010

Conclusions and Recommendations

This inspection report details observations, conclusions, and recommendations for the Pearl Queen (SITLA) portion of the Pearl Queen mine permit (M/001/0027). SITLA concurrence is needed prior to a partial bond release. A separate report for the School pit (BLM) of Pearl Queen Mine permit (M/001/0027) has been prepared.

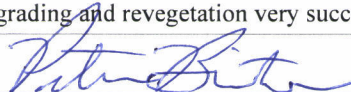
Revegetation was excellent overall, and earthwork reclamation on the regraded access road also looks very good. A partial release for revegetation and earthwork is recommended. During the 2014 road regrading, earthwork on the top of the north overburden dump has apparently enhanced rilling down the face of the angle-of-repose dump. Reclamation surety should be retained to cover the cost of revegetation on the recently regraded access road (<2 acres), as well as for reclamation of the north dump (~1.5 acres).

Elements of Inspection		Evaluated & Commented	Enforcement
1.	Permits, Revisions, Transfer, Bonds	<input checked="" type="checkbox"/>	<input type="checkbox"/>
It is recommended that bond be retained to cover remaining reclamation in the Pearl Queen area, including revegetation of the recently graded road (<2 acres) and reclamation of the north dump (~1.5 acres). Additional surety will still be required for the School area (BLM).			
2.	Public Safety (shafts, adits, trash, signs, highwalls)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
No conditions that would significantly pose a threat to public safety are present beyond those of the adjacent, undisturbed areas in either mine area. No highwalls remain. No underground openings are present. All trash has been removed. All equipment has been removed, and no structures are present.			
3.	Protection of Drainages/Erosion Control	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Revegetated slopes are effectively controlling erosion in the areas of the pit. However, there is some active erosion on steep (angle-of-repose) dump slopes, where overburden, perlite waste, and fines were placed in the north drainage, despite significant revegetation. Aerial photos show some rilling down the face of the dump in 2013. Earlier in 2014, a channel was placed across part of the dump that concentrated runoff, and the crest of the dump was rounded slightly. The sediment retention capacity of large boulders placed at the toe of the dump in the natural drainage for erosion control is gone. Large storm events that generate runoff from the upstream mine site are not anticipated to occur frequently, but rilling will continue to develop and erosion will be ongoing without additional measures. Natural erosion is not insignificant in the area, especially after recent fires. Erosion should be evaluated periodically and prior to release of the remaining bond and permit closure.			
Fine perlite has been transported approximately 1000 feet downstream (per 2013 aerial photographs), mostly prior to 2006 (based on aerial photographs), and is not associated with the current erosion. The material transported off-site appears to originate from the west side of the north dump, where more fines appear to have been placed. Currently, erosion on this part of the dump is minor. The Notice of Intent identifies perlite fines as non-deleterious. This area should be re-evaluated in the future.			
4.	Deleterious Material	<input checked="" type="checkbox"/>	<input type="checkbox"/>
No deleterious materials are known to be deposited at the site.			
5.	Roads (maintenance, surfacing, dust control, safety)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
The main access road has been regraded. An old road that accesses the toe of the north dump appears to pre-date mining.			
6.	Reclamation	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Inspected: 7/1/2014

See "Backfilling/Grading" and "Revegetation" sections.		
7.	<i>Backfilling/Grading (trenches, pits, roads, highwalls, shafts)</i>	<input checked="" type="checkbox"/> <input type="checkbox"/>
<p>As discussed in a past inspection reports, the pits were partly backfilled and the highwalls reduced to an appropriate angle for stability and revegetation. In 2014, the Pearl Queen access road was effectively recontoured to approximately match the slope's original grade from main road up to the two pits. The surface was rough and steep, and only natural levels of erosion is expected once revegetation is re-established.</p> <p>The north dump slope remains at an angle-of-repose. The approved reclamation plan requires the regrading of this slope to 2H:1V, followed by placement of soil, amended overburden, and grubbed vegetation, and reclamation surety has been retained since the previous partial release to cover the regrading work. During 2014 reclamation work, a channel was cut across part of the dump that concentrated runoff, and the crest of the dump was rounded slightly, also facilitating runoff down the dump face.</p>		
8.	<i>Soils</i>	<input checked="" type="checkbox"/> <input type="checkbox"/>
<p>A December 2007 reclamation report in the Division's files indicates that perlite rubble was amended using manure at a rate of at least 5 tons per acre, and that amended and/or natural soil material was spread at a depth of about 12 inches. The establishment of good vegetation on the graded slopes of the quarry is indication that adequate soil or soil substitute is present. Some cover appears to have been placed over perlite fines and waste on the angle-of-repose north dump.</p>		
9.	<i>Revegetation</i>	<input checked="" type="checkbox"/> <input type="checkbox"/>
<p>Revegetation is mostly excellent on all of the previously-graded pit and dump slopes. Photographs of the revegetation in 2006 (prior to the fire) suggest little evidence of beneficial species, although some may have been present under - and sheltered by - the very abundant Russian thistle. The December 2007 reclamation report states that the pit was not burned, areas around the pit were burned, and that revegetation was not successful. In December 2007, graded areas were re-ripped and seeded simultaneously using the same seed mix at an apparent rate of about 17 lbs/acre. Snowfall was reported both before and after the seeding. Aerial seeding of the general area after a significant fire in the area is thought to have also enhanced revegetation success on the mine site. By 2009, photographs indicate that a mix of weeds and numerous beneficial plants were present on the regraded slopes. In 2014, seeded and other beneficial species were dominant.</p> <p>Beneficial species present in mine reclamation areas include crested wheatgrass, other wheatgrasses, Indian ricegrass, Palmer penstamon, sagebrush, rabbitbrush, small burnet, and other species. Native volunteer species included rabbitbrush and blazing star. Cheatgrass is present in many areas, but the beneficial grasses and plants are well-established and dominant. Tumble mustard and Russian thistle are also present in lesser quantities.</p> <p>The angle-of-repose dump slopes also have significant vegetation, including rabbitbrush and some grasses, and meet revegetation requirements. Ongoing erosion will remove revegetation or prevent its establishment in some areas. Revegetation on the north dumps should be re-evaluated.</p> <p>No knapweed was observed on the SITLA reclamation areas, despite its proximity to a small, controlled area of knapweed in the Schoo pit area on BLM lands that has now been buried. No other noxious weeds were observed.</p>		
10.	<i>Other</i>	<input checked="" type="checkbox"/> <input type="checkbox"/>
<p>Most of the site regrading and revegetation very successfully meet the postmining land use of livestock grazing and wildlife habitat.</p>		

Inspector's Signature: _____



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File: /nrwogmfs1/OGM/GROUPS/MINERALS/WP/M001-Beaver/M0010027-PearlQueen/inspections/INSP-07012014-3.pdf



North dump in 2002. It appears that most of the dump is overburden. Note the white material on the left (west).



North dump in 2014. Note the vegetation and scattered but relatively minor erosion and rilling.



North dump in 2002. The fines had eroded off the dump and down the drainage.



North dump in 2014. Revegetation is established in the west (perlite fines) area of the dump. The cut on the left appears to pre-date this permit, as juniper are growing.



Channel cut across part of the north dump, which has concentrated flow over the rounded dump crest.



The largest of a few flowpaths down the face of the north dump. This one is below the recently-cut channel. Note the depth of material eroded from around the grass in the middle.



View down the reggraded access road.



View up the reggraded access road, of the rounded north dump crest, and into the pit and north dump area.



View of the regraded and revegetated Pearl Queen pit area, looking west. Note the recently regraded access road on the right. Revegetation requirements have been met for historical grading.



View of the regraded and revegetated Pearl Queen pit area, looking west.